

517,104

Pat'd PCT/PTA 07 DEC 2004

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/007509 A1

(51) International Patent Classification⁷: **C07F 15/04**,
15/00, C08F 10/00

(21) International Application Number:
PCT/US2003/022356

(22) International Filing Date: 17 July 2003 (17.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/396,370 17 July 2002 (17.07.2002) US

(71) Applicant (for all designated States except US): **EXXON-MOBIL CHEMICAL PATENTS INC.** [US/US]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US).

(71) Applicant (for US only): **CHERKASOV, Vladimir, K.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DRUZHKOVA, Nikolay, O.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US). **TEPLOVA, Irina, A.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US). **GLUSHAKOVA, Valentina, N.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US). **SKORODUMOVA, Nina, A.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US). **ABAKUMOV, Gleb, A.** [RU/RU]; 5200 Bayway Drive, Baytown, TX 77520-2101 (US). **ZHAO, Baiyi** [US/US]; 3014 Hickory Falls Drive, Kingwood, TX 77345 (US). **BERLUCHE, Enock** [US/US]; 55 Peddlers Lane, Phillipsburg, NJ 08865 (US). **SCHULZ,**

Donald, N. [US/US]; P.O. Box 58, Valley Crest Rd, Anandale, NJ 05801 (US). **BAUGH, Lisa, S.** [US/US]; 71 Manners Road, Ringoes, NJ 08551 (US). **BALLINGER, Cynthia, A.** [US/US]; 21407 Park Downe Lane, Katy, TX 77450 (US). **SQUIRE, Kevin, R.** [US/US]; 2111 Seven Maples Drive, Kingwood, TX 77345 (US). **CANICH, Jo Ann, M.** [US/US]; 14710 Mesa Verde Drive, Houston, TX 55059 (US). **BUBNOV, Michael, P.** [RU/RU]; Zvezdinka str. 3-74, Nizhnii Novgorod (RU).

(74) Agents: **BELL, Catherine, L.** et al.; ExxonMobil Chemical Company, P.O. Box 2149, Baytown, TX 77522-2149 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LATE TRANSITION METAL CATALYSTS FOR OLEFIN POLYMERIZATION AND OLIGOMERIZATION

(57) Abstract: This invention relates to a transition metal compound represented by the formula LMX wherein M is a Group 3 to 11 metal L is a bulky bidentate or tridentate neutral ligand that is bonded to M by two or three heteroatoms and at least one heteroatom is nitrogen; X is a substituted or unsubstituted catecholate ligand provided that the substituted catecholate ligand does not contain a 1,2-diketone functionality.



WO 2004/007509 A1

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/22356

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07F15/04 C07F15/00 C08F10/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07F C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

CHEM ABS Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ABAKUMOV, G. A. ET AL: "Bis(1,4-di-tert-butyl-1,4-diazabutadiene) copper(I) '(3,6-di-tert-butyl-o- benzosemiquinono)(3,6-di-tert-butylcatecho lato)cuprate(II)!. The molecula structure and intramolecular electron transfer" RUSSIAN CHEMICAL BULLETIN (TRANSLATION OF IZVESTIYA AKADEMII NAUK, SERIYA KHIMICHESKAYA) (2001), 50(11), 2193-2199, 2001, XP002228902 the whole document ---	1
A	WO 00 010945 A (E.I.DU PONT DE NEMOURS AND COMPANY) 2 March 2000 (2000-03-02) cited in the application the whole document --- -/--	1-26

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

21 October 2003

Date of mailing of the international search report

30/10/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Rinkel, L

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 03/22356

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>KANNAN S ET AL: "Dinuclear diimine palladium(II) and platinum(II) hydroxo and amido complexes: synthesis and X-ray crystal structures"</p> <p>POLYHEDRON, PERGAMON PRESS, OXFORD, GB, vol. 19, 2000, pages 155-163, XP002221653</p> <p>ISSN: 0277-5387</p> <p>the whole document -----</p>	1

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No

PCT/US 03/22356

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 00010945	A	02-03-2000	AU	5490099 A		14-03-2000
			WO	0010945 A1		02-03-2000
